CLAIMS

1. A slurry for polishing a barrier layer for copper-based metallurgy, comprising an oxidizing agent for oxidizing cooper, a cooper oxidation inhibitor, and an additive that appreciably regulates complexing between copper and the oxidation inhibitor.

2. The slurry as recited in Claim 1, wherein said oxidizing agent is selected from the group consisting of ferric nitrate and compounds thereof, hydrogen peroxide, potassium iodate, manganese oxide, ammonium hydroxide, ammonium persulphate, potassium persulphate, ammonium persulphate/sulfuric acid, potassium persulphate/sulfuric acid, ferric chloride/hydrochloric acid, chromic acid, chromic acid/hydrochloric acid, potassium bichromate/sulfuric acid, and stearic acid.

3. The slurry as recited in Claim 1, wherein said oxidizing agent comprises hydrogen peroxide.

4. The slurry as recited in Claim 1, wherein said oxidation inhibitor is selected from the group consisting of 1-H benzotriazole, 1- OH benzotriazole, 1-CH3 benzotriazole, 5-CH3 benzotriazole, benzimidazole, 2 OH, 2-methyl -benzimidazole, and 5-Cl benzotriazole.

5. The slurry as recited in Claim 1, wherein said oxidation inhibitor comprises a benzotriazole.

6. The slurry as recited in Claim 1, wherein said additive is comprised of a sulfated fatty acid.

7. The slurry as recited in Claim 6, wherein said sulfated fatty acid has a molecular weight less than approximately 300.

8. The slurry as recited in Claim 7, wherein said sulfated fatty acid is selected from the group consisting of sodium octyl sulfate, Duponol SP, and Duponol WN.

9. The slurry as recited in Claim 1, wherein said additive comprises Duponol SP.

10. The slurry as recited in Claim 1, further comprising colloidal silica.

11. The slurry as recited in Claim 10, wherein said colloidal silica has particulate having a size less than approximately 0.4 microns.

12. The slurry as recited in Claim 1, wherein said slurry has a pH of approximately 2.0 to 7.5.

13. The slurry as recited in Claim 12, wherein said slurry has a pH of approximately 4.5.

14. A CMP slurry for polishing a diffusion barrier layer liner for a layer of copper or a copper alloy in a semiconductor substrate, said slurry providing a first removal rate of said liner and a second removal rate of copper, said first removal rate being about eight times greater than said second removal rate, comprising a copper oxidizing agent, a copper oxidation inhibitor, and an additive that appreciably regulates complexing between copper and the oxidation inhibitor.

15. The slurry as recited in Claim 14, wherein said oxidizing agent is selected from the group consisting of hydrogen peroxide, potassium iodate, manganese oxide, ferric nitrate, ammonium hydroxide, ammonium persulphate, potassium persulphate, ammonium persulphate/sulfuric acid, potassium persulphate/sulfuric acid, ferric chloride/hydrochloric acid, chromic acid, chromic acid/hydrochloric acid, potassium bichromate/sulfuric acid, and stearic acid.

16. The slurry as recited in Claim 15, where in said oxidizing comprises hydrogen peroxide.

17. The slurry as recited in Claim 14, wherein said oxidation inhibitor is selected from the group consisting of 1-H benzotriazole, 1-OH benzotriazole, 1-CH3 benzotriazole, 5-CH3 benzotriazole, benzimidazole, 2 OH, 2-methyl-benzimidazole, and 5-Cl benzotriazole.

18. The slurry as recited in Claim 17, wherein said oxidation inhibitor comprises a benzotriazole.

19. The slurry as recited in Claim 14, wherein said additive is comprised of a sulfated fatty acid.

20. The slurry as recited in Claim 19, wherein said sulfated fatty acid has a molecular weight less than approximately 300.

21. The slurry as recited in Claim 19, wherein said sulfated fatty acid is selected from the group consisting of sodium octyl sulfate, Duponol SP, and Duponol WN.

22. The slurry as recited in Claim 14, wherein said additive comprises Duponol SP.

23. The slurry as recited in Claim 14, further comprising colloidal silica.

24. The slurry as recited in Claim 23, wherein said colloidal silica has particulates having a size less than approximately 0.4 microns.

25. The slurry as recited in Claim 14, wherein said slurry has a pH of approximately between 3.0 to 7.5.

26. The slurry as recited in claim 25, wherein said slurry has a pH of about 4.5.

27. A slurry for removing a tantalum-based barrier layer liner for copper-based metallurgy comprising:

about one liter of colloidal silica slurry containing between 2 and 30 percent by weight solids in water;

up to 10 ml/liter 30 percent aqueous hydrogen peroxide;

between 1.5 and 6.0 ml/liter sodium lauryl sulfate;

up to 6.0 ml/liter surfactant;

up to 4.0 g/liter benzotriazole; and

said slurry being adjusted to have a pH of between 3.0 and 7.5.

28. A slurry for removing a tantalum-based barrier/liner for copper-based metallurgy comprising:

one liter of colloidal silica slurry containing 15 percent by weight silica;

3.0 ml/liter 30 percent aqueous hydrogen peroxide;

3.0 ml/liter Duponol SP;

1.2 g/liter benzotriazole

balanced to a pH of 4.5.